MONTANA DEPARTMENT OF TRANSPORTATION

Practice Math Book

QA39.2
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1993

GA39.2.047 1993

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INTRODUCTION

This work book is designed as a tool to help practice Math skills. The Math is the kind used on a regular basis by the Montana Department of Transportation, in both Construction and Maintenance areas.

As you go through each portion and work the problems, you can check your answers which are located at the back. Use of a calculator is encouraged.

1993

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MONTANA DEPARTMENT OF TRANSPORTATION

Practice Math Book

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MONTANA DEPARTMENT OF TRANSPORTATION
Practice Math Book

NAME_____

1.
```
   86
+ 78
-----
```

2.
```
  7999
+ 7785
-------
```

3.
```
   306
   195
+ 440
-----
```

4. The Department maintains 1,194 miles of interstate highways, 5,469 miles of primary, 4,706 miles of secondary, and 335 miles of urban highways. What is the total number of miles maintained by the Montana Department of Transportation?

5.
```
  735
- 609
-----
```

6.
```
  8743
-  599
-------
```

7. A truck loaded with gravel wighs 88,870 pounds. The weight of the empty truck (called the tare weight) is 33,945 pounds. What is the weight of the gravel in the truck?

8.
$$\begin{array}{r} 49 \\ \times\ 3 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 656 \\ \times 88 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 3264 \\ \times 9 \\ \hline \end{array}$$

11. $5\overline{)\ 8620}$

12.

$9\overline{)819}$

13.

$8\overline{)5440}$

14.

$21\overline{)3087}$

15.

$111\overline{)3219}$

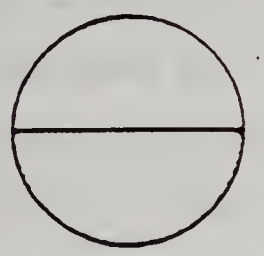
16.

$$60 \overline{)\ 302}$$

CHAPTER 2. FRACTIONS

2.1 FRACTIONS

The study of arithmetic begins with whole numbers. However, the need soon arises to show parts of a whole such as halves, thirds, fourths, and so on. These numbers are called fractions. Fractions represent one or more equal parts of a unit.

$\frac{1}{2}$ 

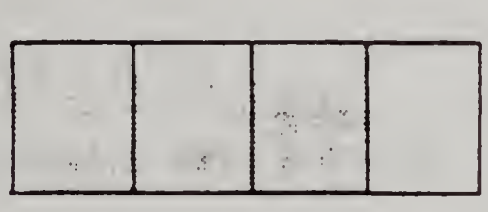
$\frac{1}{3}$

$\frac{3}{4}$

These numbers are written in fractional notation. The top number is called the numerator and the bottom number is called the denominator.

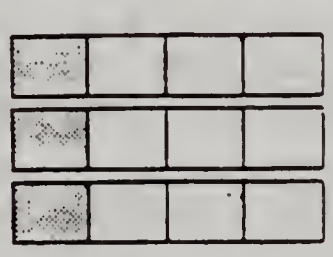
$\frac{7}{8}$ Numerator (tells how many equal parts of the whole are represented)
Denominator (tells into how many equal parts the whole is divided)

Fractions can be represented by a drawing. The total number of parts in the figure represents the denominator. The numerator is the shaded portion of the figure.



$\frac{3}{4}$

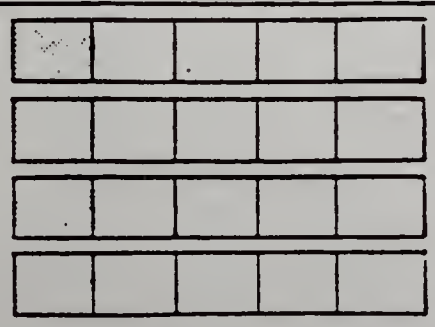
There is another way to show the fraction 3/4. Take three objects, divide each object into fourths, and take 1/4 of each object. This is 1/4 x 3, or 3/4.



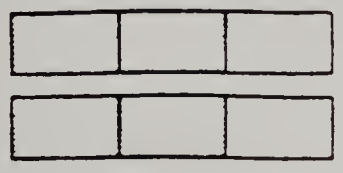
3/4 is shaded

EXAMPLES:

2 x 1/3 = 2/3

4 x 1/5  = 4/5

Now divide two objects into three parts each and take four parts.



4/3 is shaded

When the numerator is larger than, or equal to, the denominator it is said to be an improper fraction.

4/3 is the same as 3/3 + 1/3 which may also be written 1 1/3.

1 1/3 is a mixed number which is any whole number and a fraction of a whole number. The mixed number can be found by dividing the numerator of the fraction by the denominator.

$$3\overline{)4}\quad 1 \text{ r } 1 \qquad \text{or } 1\ 1/3$$

$$\frac{3}{1}$$

EXAMPLES: 9/5 = 1 4/5

13/2 = 6 1/2

34/16 = 2 2/16 = 2 1/8

Mixed numbers must be changed to improper fractions before they can be added, subtracted, multiplied, or divided.

To change a mixed number to a fraction, first multiply the whole number by the denominator of the fraction, then add the numerator to this product. This answer becomes the numerator. The denominator remains the same.

EXAMPLE: $2\ 5/8 = \frac{(2 \times 8) + 5}{8} = \frac{16 + 5}{8} = \frac{21}{8}$

Fractional Notation for 1

Fractions are equal to 1 when the numerator and the denominator are the same number. Remember that any whole number (greater than zero) divided by itself is 1.

EXAMPLES: 2/2 = 1

4/4 = 1

9/9 = 1

Equivalent Fractions

Fractions are said to be equivalent when they measure the same amount.

These three rectangles are the same size. The same amount is shaded in each rectangle even though the fractional notation is different.

1/2

2/4

6/12

When both the numerator and denominator of any fraction are multiplied by the same number, the value of the fraction is not changed. Thus, the fractions are equivalent.

EXAMPLES: $\frac{1 \times 2}{2 \times 2} = \frac{2}{4}$

$\frac{1 \times 6}{2 \times 6} = \frac{6}{12}$

If you divide the numerator and denominator by the same number you also will get an equivalent fraction.

EXAMPLES: $\frac{2 \div 2}{4 \div 2} = \frac{1}{2}$

$\frac{6 \div 6}{12 \div 6} = \frac{1}{2}$

Therefore, 1/2 = 2/4 = 6/12.

Reducing Fractions

To reduce a fraction, find a whole number that will divide evenly into both the numerator and the denominator. The fraction is said to be in its lowest terms if the numerator and denominator have no common divisor except 1.

EXAMPLE: $\frac{12}{18} = \frac{2}{3}$

$$\frac{12 \div 6}{18 \div 6} = \frac{2}{3}$$

OR

At first glance, we know that both parts are divisible by 2 because both are even numbers.

$\frac{12 \div 2}{18 \div 2} = \frac{6}{9}$ This, however, is not the lowest equivalent as both parts can be reduced further by dividing by 3.

$\frac{6 \div 3}{9 \div 3} = \frac{2}{3}$ Lowest equivalent.

To reduce a larger fraction, you may find it helpful to write the prime factorization of both the numerator and denominator.

EXAMPLE: Simplify: 84/90.

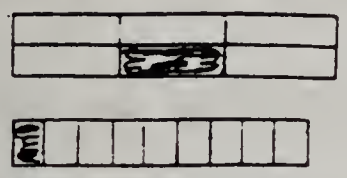
$$\frac{84}{90} = \frac{2 \times 2 \times 3 \times 7}{2 \times 3 \times 3 \times 5}$$

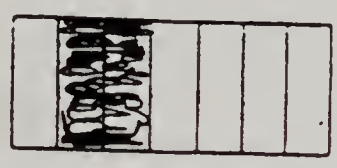
Remove any factors of 1, then multiply the remaining primes.

$$\frac{84}{90} = \frac{\cancel{2} \times 2 \times \cancel{3} \times 7}{\cancel{2} \times 3 \times \cancel{3} \times 5} = \frac{2 \times 7}{3 \times 5} = \frac{14}{15}$$

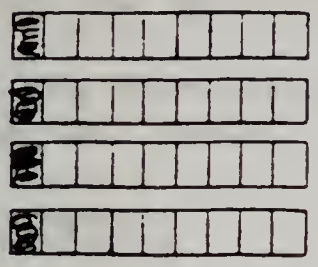
$$\frac{84}{90} = \frac{14}{15}$$

17. What fraction of each object or set of objects is shaded?

1. 

2. 

3.

4. 

5.

6.

18. Write the following fractions as a mixed number.

a) $\frac{11}{3}$

b) $\frac{14}{5}$

c) $\frac{31}{7}$

CHAPTER 3. DECIMAL NUMBERS

3.1 DECIMAL NOTATION AND PLACE VALUE

There are three basic kinds of numbers: whole numbers, fractional numbers, and decimal numbers.

Whole Numbers	Fractional Numbers	Decimal Numbers
0	$\frac{1}{100}$ or 1/100	.01
40	$40\ \frac{3}{4}$ or 40 3/4	40.75
327	$327\ \frac{1}{16}$ or 327 1/16	327.0625

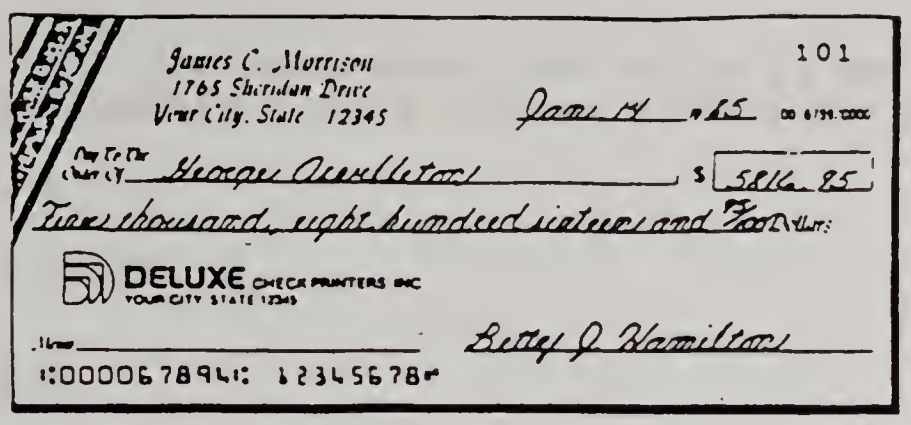
Decimal numbers have a decimal point and one or more digits to the right of the decimal point. The place value of each column is 1/10 the value of the column to the left.

Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Ten Thousandths	Hundred Thousandths
100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10,000}$	$\frac{1}{100,000}$
	6	9 .	6	7	5		

6 represents Tens or	6 x 10	=	60
9 represents Ones or	9 x 1	=	9
6 represents Tenths or	6 x .1	=	0.6
7 represents Hundredths or	7 x .01	=	0.07
5 represents Thousandths or	5 x .001	=	0.005
			69.675

69.675 may be written in fractional notation, 69 675/1000. The word name is written sixty-nine and six hundred seventy-five thousandths.

Decimal notation is also used to express monetary value. On a check, it is common to write the numerical amount in decimal notation ($52.89) and on the following line write it out as "Fifty-two and 89/100" for "Fifty-two dollars and eighty-nine cents."



Converting from Decimal to Fractional Notation

When converting from decimal to fractional notation, the number or numbers to the right of the decimal point become the numerator and the place value of the denominator is determined by counting the number of digits to the right of the decimal point. If there are two digits, the denominator will have two zeros.

EXAMPLE: Convert .5830 to fractional notation.

a) Numbers to the right of the decimal point become the numerator.
b) Count the number of decimal places - 4 places - the denominator will have 4 zeros.

$$\frac{5830}{10000}$$

EXAMPLE: Write $12.95 in fractional notation.

$12.95 = $12 95/100
Commonly written on a check as: Twelve and 95/100.

Decimal notation can also be shown as the addition of place values.

EXAMPLES: 9.861 = 9 + 8/10 + 6/100 + 1/1000

25.033 = 25 + 0/10 + 3/100 + 3/1000

116.79 = 116 + 7/10 + 9/100

Converting from Fractional to Decimal Notation

When working with fractions other than simple fractions, it is often easier to change fractions to decimal fractions before adding, subtracting, multiplying and dividing.

Fractions with ten or a power of ten as the denominator are easily written as decimals. Allow as many decimal places as there are zeros in the denominator. Place a decimal point in front of the numerator and eliminate the denominator. (NOTE: Zeros may be needed as place holders.)

EXAMPLES: 1/10 = 0.1 (1 zero in the denominator - 1 decimal place)

3/100 = 0.03 (2 zeros in the denominator - 2 decimal places)

75/100 = 0.75 (2 zeros in the denominator - 2 decimal places)

When the denominator is a number other than ten or a power of ten, divide the numerator by the denominator of the fraction to find the decimal notation.

EXAMPLE: $1/4 = 0.25$

$1/4 = 4\overline{)1.0}$

$$
\begin{array}{r}
0.25 \\
4\overline{)1.00} \\
\underline{8} \\
20 \\
\underline{20} \\
0
\end{array}
$$

EXAMPLE: $7/8 = 0.875$

$7/8 = 8\overline{)7.0}$

$$
\begin{array}{r}
0.875 \\
8\overline{)7.000} \\
\underline{6.4} \\
60 \\
\underline{56} \\
40 \\
\underline{40} \\
0
\end{array}
$$

To change a mixed number to a decimal number, place a decimal point after the whole number and divide the fractional part of the mixed number.

EXAMPLE: Change 9 2/3 to a decimal number.

$9\ 2/3 = 9 + 2/3$

$$
\begin{array}{r}
0.6666 \\
3\overline{)2.0000} \\
\underline{18} \\
20 \\
\underline{18} \\
20 \\
\underline{18} \\
20 \\
\underline{18}
\end{array}
$$

(NOTE: When division results in the infinite repetition of digits, a line can be placed above the number or numbers in the repeating pattern to indicate the sequence of numbers. If carrying to the hundredths the number can be written $.6\overline{6}$ or rounded to .67.)

$9 + 0.6\overline{6}$

Therefore $9\ 2/3 = 9.6\overline{6}$ or 9.67.

EXAMPLE: Change 4/11 to a decimal fraction.

$4/11 = 11\overline{)4.0}$

```
    0.3 6 3 6 3 6
1 1/4.0 0 0 0 0 0
    3 3
      7 0
      6 6
        4 0
        3 3
          7 0
          6 6
            4 0
            3 3
              7 0
              6 6
```

Since the digits 36 repeat indefinitely, decimal notation may be written $0.\overline{36}$.

Therefore, $4/11 = 0.\overline{36}$.

Rounding

To round off a number is to reduce the number of digits used. Decimal fractions can be rounded off to any place value. Rounding to tenths, hundredths, or thousandths depends on the degree of accuracy needed and the nature of the work and the materials involved. For example, in a gradation analysis the weight of aggregate retained on and passing the 4 mesh and larger screens is rounded to the nearest hundredth. The weight retained on and passing the screens smaller than 4 mesh is rounded to the nearest tenth.

As a rule, when the digit to be dropped is less than 5, drop that digit and all digits to the right of it. When the digit to be dropped is 5 or greater than 5, increase the digit preceding by 1 and drop all digits to the right.

EXAMPLES: Round to the nearest hundredth.

2.4913 = 2.49

7.2358 = 7.24

8.0695 = 8.07

13.597 = 13.60

19. Write the following decimal numbers in fractional notation:

a) 0.89	b) 46.03	c) 5138.2
d) 265.732	e) 1.0008	f) 3.76
g) 5.904	h) 83.025	i) 9.2007

20. Write the following fractions in decimal notation:

a) 429 7/10 b) 5/16 c) 80 32/100

d) 125 3/5 e/ 22 7/8 f) 5 19/64

g) 77 4/9 h) 51/10,000 i) 3 5/24

3.2 ADDITION AND SUBTRACTION OF DECIMALS

Adding and Subtracting Decimal Numbers

When adding or subtracting decimal numbers line up the decimal points under one another to keep each digit in the proper place value column. Add or subtract the columns, carrying or borrowing if necessary, as though the decimal point weren't there. The decimal point merely separates the ones column from the tenths column.

EXAMPLE: Add: 56.227 + 7.8 + 19.09.

```
  5  6. 2  2  7
     7. 8
+ 1  9. 0  9
-------------
        .     7
```
Add thousandths.

```
       (1)
  5  6. 2  2  7
     7. 8
+ 1  9. 0  9
-------------
        .  1  7
```
Add hundredths.

```
     (1)(1)
  5  6. 2  2  7
     7. 8
+ 1  9. 0  9
-------------
        . 1  1  7
```
Add tenths.

```
    (2)(1)(1)
  5  6. 2  2  7
     7. 8
+ 1  9. 0  9
-------------
     3. 1  1  7
```
Add ones.

```
    (2)(1)(1)
  5  6. 2  2  7
     7. 8
+ 1  9. 0  9
-------------
  8  3. 1  1  7
```
Add tens.

Zeros may be added so each number has the same number of decimal places.

```
  5 6. 2 2 7
    7. 8
+ 1 9. 0 9
-----------
  8 3. 1 1 7
```

OR

```
  5 6. 2 2 7
    7. 8 0 0
+ 1 9. 0 9 0
-----------
  8 3. 1 1 7
```

When a problem contains a whole number you may place a decimal point after the whole number and add as many zeros to the right as necessary to have the same number of decimal places. Conversely, if the answer has zeros to the right of a decimal point, the zeros may be dropped if they are not followed by another digit.

EXAMPLE: Subtract: 3 - 0.004

$$\begin{array}{r} 2\ 9\ 9\ 10 \\ \not{3}.\ \not{0}\ \not{0}\ \not{0} \\ -\ 0.\ 0\ 0\ 4 \\ \hline 2.\ 9\ 9\ 6 \end{array}$$

Check:

$$\begin{array}{r} (1)(1)(1) \\ 0.\ 0\ 0\ 4 \\ +\ 2.\ 9\ 9\ 6 \\ \hline \not{3}.\ \not{0}\ \not{0}\ \not{0} \end{array}$$

Solving Problems

EXAMPLE: A group of soil samples weighs 3.68 grams, 2.7 grams, 4.83 grams, and 5.0 grams. What is the total weight of the samples?

Translate to a number sentence.

1st Sample	+	2nd Sample	+	3rd Sample	+	4th Sample	=	Total Weight
3.68 g	+	2.7 g	+	4.83 g	+	5.0 g	=	?

Add.

$$\begin{array}{r} 3.6\ 8 \\ 2.7\ 0 \\ 4.8\ 3 \\ 5.0\ 0 \\ \hline 1\ 6.2\ 1 \end{array}$$

The total weight of the samples is 16.21 grams.

Estimating Sums

Sums can be estimated by first rounding and then calculating. An estimate or rough calculation can be used to check the actual sum.

EXAMPLE: Estimate the following sum by rounding to the nearest tenth, hundredth, and thousandth. Then add.

Sum	Tenth	Hundredth	Thousandth
2.9730	3.0	2.97	2.973
11.8700	11.9	11.87	11.870
3.2553	3.3	3.26	3.255
18.0983	18.2	18.10	18.098

21. Add:

(a)	(b)	(c)
5.2391	0.347	2119.39
+ 19.0637	+ 7.51	+ 4.25

22. Subtract:

(a)	(b)	(c)
28.2	950.0	62.3
-19.35	-0.807	-6.0

23. The odometer reading on a state motor pool vehicle was 22,536.8 miles. If 478.6 miles were traveled, what is the odometer reading at the end of the trip?

3.4 MULTIPLICATION OF DECIMALS

Multiplying Decimal Numbers

Multiplying a decimal number by 10 or a multiple of 10 moves the decimal point in the number to the right a number of places equal to the number of zeros in the multiplier.

EXAMPLES: 729.15 x 10 = 7291.5

376.48 x 100 = 37,648

1.8622 x 1000 = 1862.2

When multiplying a decimal number and a whole number the product will have the same number of digits following the decimal point as the decimal number.

EXAMPLES: 503 x .16 = 80.48

2.9 x 4 = 11.6

32.034 x 56 = 1793.904

When multiplying two numbers with decimal places, set up the problem and multiply as if you were multiplying whole numbers. Numbers are lined up from the right without regard to decimal points. Count the total number of digits following the decimal point in both factors. There must be that number of digits to the right of the decimal point in the answer.

EXAMPLE:

65.167		3 digits after decimal point
x 8.25		2 digits after decimal point
537.62775		5 digits after decimal point

(NOTE: Decimal points are not lined up.)

Sometimes it is necessary to place a zero to the left of the answer as a place holder so you have the required number of digits to the right of the decimal point.

EXAMPLE:

9.6	1 digit after decimal point
x 0.0016	4 digits after decimal point
.01536	5 digits after decimal point

Remember, misplacing the decimal point in the answer by one place value means the answer will be wrong by a multiple of 10.

Solving Problems

EXAMPLE: The cost to drive a piece of equipment is 17¢ per mile. What is the cost in dollars to drive 225 miles?

Translate.

Cost Per Mile		Miles Driven		Total Cost
0.17	x	225	=	n

Multiply.

$$\begin{array}{r} 225 \\ \times\ 0.17 \\ \hline 1575 \\ 225 \\ \hline 38.25 \end{array}$$

The total cost is $38.25.

24. Multiply:

(a)	(b)	(c)
573	129	7.02
x6.1	x0.44	x0.56
_____	_____	_____

3.5 DIVISION OF DECIMALS

Dividing Decimal Numbers

Dividing a decimal number by 10 or a multiple of 10 moves the decimal point to the left a number of places equivalent to the number of zeros in the divisor. Dividing by 10 moves the decimal point one place to the left, dividing by 100 moves the decimal point two places to the left, and so on.

EXAMPLES: $310.29 \div 10 = 31.029$

$749.62 \div 100 = 7.4962$

$831.25 \div 1000 = 0.83125$

When dividing a decimal number by a whole number, place the decimal point in the answer directly above the decimal point in the dividend.

EXAMPLE:

```
      3.4 2
   ----------
2 4/8 2.0 8
      7 2
      -----
      1 0 0
        9 6
      -------
          4 8
          4 8
        -----
            0
```

When the divisor is a decimal fraction it is necessary to make that number a whole number by multiplying by ten or a multiple of ten before dividing.

If the dividend is a whole number, tag on a number of zeros equivalent to the number of places the decimal point was moved in the divisor.

EXAMPLE: Divide: $6 \div 0.15$.

$.15\overline{)6}$

a) Multiply the divisor by 100 which moves the decimal point <u>two</u> places to the right.

$.15 \times 100 = 15.$

b) Now multiply the dividend by 100, which is the same as tagging on <u>two</u> zeros.

$6. \times 100 = 600.$

c) Divide.

$$15.\overline{)600.} \quad 40$$

$$\begin{array}{r} 60 \\ \hline 00 \end{array}$$

d) Therefore, $6 \div 0.15 = 40$.

e) Check by multiplying.

$6 = 0.15 \times 40$

$$\begin{array}{r} 0.15 \\ \times\ 40 \\ \hline 6.00 \end{array}$$

If the dividend is a decimal number, move the decimal point to the right the same number of places in the dividend as in the divisor.

EXAMPLE: Divide: $3.75 \div 0.25$.

$.25\overline{)3.75}$

a) Multiply the divisor by 100 which moves the decimal point <u>two</u> places to the right.

b) Move the decimal point in the dividend <u>two</u> places to the right.

$.25\overline{)3.75}$

c) Divide.

$$
\begin{array}{r}
\;15 \\
25.\overline{)375.} \\
\;25 \\
\hline
125 \\
125 \\
\hline
\;\;0
\end{array}
$$

d) Check by multiplying the divisor and the quotient.

$$
\begin{array}{r}
0.25 \\
\times\ 15 \\
\hline
125 \\
25 \\
\hline
3.75
\end{array}
$$

Therefore, $3.75 \div 0.25 = 15$.

EXAMPLE: Divide: $20.1 \div 0.24$.

$.24\overline{)20.1}$

a) First, move the decimal point in the divisor two places to the right.

b) In order to move the decimal point in the dividend two places to the right, it is necessary to tag on one zero.

$.24\overline{)20.10}$

c) Divide. Because 24 does not divide evenly into 2010 it is necessary to add additional zeros after the decimal point in the dividend. Place the decimal point in the answer directly above the decimal point in the dividend.

$$
\begin{array}{r}
\;83.75 \\
24.\overline{)2010.00} \\
192 \\
\hline
\;\;90 \\
\;\;72 \\
\hline
180 \\
168 \\
\hline
\;120 \\
\;120 \\
\hline
\;\;\;0
\end{array}
$$

d) Check.

$$
\begin{array}{r}
83.75 \\
\times\ 0.24 \\
\hline
3350\,0 \\
16750 \\
\hline
20.1000
\end{array}
$$

Therefore, $20.1 \div 0.24 = 83.75$.

Solving Problems

EXAMPLE: How many minutes are in 495 seconds?

Translate.

Number of Minutes	is	Total Number of Seconds	divided by	Number of Seconds in One Minute
n	=	495	÷	60

Divide.

$$60\overline{)495.00} = 8.25$$

$$\begin{array}{r} 480 \\ \hline 150 \\ 120 \\ \hline 300 \\ 300 \\ \hline 0 \end{array}$$

There are 8.25 minutes in 495 seconds.

25. Divide:

(a) $12\overline{)1.8}$

(b) $82\overline{)38.54}$

(c) $4.8\overline{)75}$

CHAPTER 4. PERCENT - RATIO - AVERAGE

4.1 PERCENT

Percent comes from a Latin word meaning "by the hundred." A fraction having a denominator of 100 expresses a percent. Thus 7/100 (.07) is the same as 7%. If the water content of a soil is 7%, this means that for every 100 grams of soil, there are 7 grams of water.

Converting from Decimal to Percent Notation

To change a decimal number to a percent, move the decimal point two places to the right and place the percent sign, %, after the number.

EXAMPLES: 0.05 = 5%
0.98 = 98%
2.30 = 230%
0.007 = 0.7%

Converting from Percent to Decimal Notation

To change a percent to a decimal fraction, take off the percent sign and move the decimal point two places to the left. Add zeros for place holders if necessary.

EXAMPLES: 2% = 0.02
75% = 0.75
140% = 1.40
0.6% = 0.006

Converting a Fraction to Percent Notation

To change a fraction to percent, first express the fraction as a decimal number by dividing the numerator by the denominator. Then move the decimal point two places to the right.

EXAMPLES: $\frac{8}{100} = 0.08 = 8\%$

$\frac{10}{50} = 0.2 = 20\%$

$\frac{16}{64} = 0.25 = 25\%$

$\frac{45}{15} = 3.0 = 300\%$

EXAMPLE: 75% of what number is 30?

a) Change percent to decimal notation.

75% = 0.75

b) Divide. 30 ÷ 0.75 = 40.

$$
\begin{array}{r}
40 \\
.75\overline{)30.00} \\
300 \\
\hline
00
\end{array}
$$

c) Check by multiplying.

$$
\begin{array}{r}
40 \\
\times\ 0.75 \\
\hline
200 \\
280 \\
\hline
30.00
\end{array}
$$

Therefore, 75% of 40 is 30.

TABLE OF EQUIVALENTS

Fractional Notation	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{5}$	$\frac{2}{5}$	$\frac{3}{5}$	$\frac{4}{5}$
Decimal Notation	0.5	$0.3\overline{3}$	$0.6\overline{6}$	0.25	0.75	0.2	0.4	0.6	0.8
Percent Notation	50%	$33.\overline{3}\%$	$66.\overline{6}\%$	25%	75%	20%	40%	60%	80%

26. Convert to percent:

a) 0.42 b) 1.56 c) 0.018

d) $\frac{63}{100}$ e) $\frac{19}{20}$ f) $\frac{3}{75}$

g) $\frac{5}{6}$ h) $\frac{18}{4}$ i) $\frac{21}{56}$

27. Convert to decimal notation:

a) 91% b) 3% c) 0.7%

d) 145% e) 2.8% f) 69.5%

28. Find 29% of 631

29. Find 41% of 97

30. Find 9% of 224

31. Find 66.5% of 180

Using Units of Measurement

Linear Measurements

The term "measurement" is used to mean the actual measure of something–actual length, actual weight, actual area or actual volume.

Linear measurements are measurements of **length** or distance. Measurements of length are expressed in inches, feet, yards, rods, miles. Measurements can be made on straight lines or curved lines, round circles, oblong circles or parts of circles. The term "linear" means length. The term "lineal" means straight-line length.

Area Measurements

Area measurements are measurements of **surface sizes**. Measurements of areas are expressed in square inches, square feet, square yards, and acres. Measurements of the area of circles are also expressed in square inches, square feet, and square yards.

Volume Measurements

Volume measurements are measurements of capacities (the amounts of space involved). Measurements of volume are expressed in cubic inches, cubic feet, cubic yards, pints, quarts, gallons and board feet.

Linear Measures		Area Measures	
12 inches	= 1 foot	144 square inches	= 1 square foot
36 inches	= 1 yard	9 square feet	= 1 square yard
3 feet	= 1 yard	43,560 square feet	= 1 acres
16.5 feet	= 1 rod		
5280 feet	= 1 mile		
1760 yards	= 1 mile		

Linear Measures	Liquid Volume Measures
1 inch = 0.0833 feet	2 pints = 1 quart
2 inches = 0.17 feet	8 pints = 1 gallon
3 inches = 0.25 feet	4 quarts = 1 gallon
4 inches = 0.33 feet	7.48 gallons = 1 cubic foot
6 inches = 0.50 feet	

Volume Measures	Weight Measure
1728 cu.in. = 1 cubic foot	16 ounces = 1 pound
27 cu.ft. = 1 cubic yard	2000 pounds = 1 ton
	8.34 lbs. water = 1 gallon

Weight Measurements

Units Used

The two most common units of weight measurement are pounds and tons.

+ Sixteen ounces equal one pound.
+ Two thousand pounds equal one ton.
+ The abbreviation for pounds is "lbs."
+ The abbreviation for tons is "T."
+ The symbol for pounds is "#."

Converting Units Of Measure

Multiply	By	To Obtain
inches	0.083	feet
feet	12	inches
yards	3	feet
rods	16.5	feet
miles	5280	feet
square feet	144	square inches
square yards	9	square feet
acres	43,560	square feet
acres	4840	square yards
cubic feet	1728	cubic inches
cubic yards	27	cubic feet
board feet	144	cubic inches
cubic feet	12	board feet
cubic feet	7.48	gallons
gallons of water	8.34	pounds
pounds	16	ounces
tons	2000	pounds
quarts	2	pints
gallons	8	pints
gallons	4	quarts
gallons	0.13	cubic feet

Divide	By	To Obtain
inches	12	feet
inches	36	yards
feet	3	yards
feet	16.5	rods
feet	5280	miles

Divide	By	To Obtain
yards	1760	miles
square inches	144	square feet
square feet	9	square yards
square feet	43,560	acres
square yards	4840	acres
cubic inches	1728	cubic feet
cubic feet	27	cubic yards
cubic inches	144	board feet
board feet	12	cubic feet
gallons	7.48	cubic feet
ounces	16	pounds
pounds	2000	tons
pounds	8.34	gals. of water
pints	2	quarts
quarts	4	gallons

32. Convert the following:

a) 30 feet = _____ yards

b) 27 sq. ft. = _____sq. yds.

c) 5280 ft. = _____mile

d) 33 feet = _____ rods

e) 6 sq. yds. = _____ sq. ft.

f) 2 cu. yds. = _____ cu. ft.

33. An aggregate-asphalt mix weighs 3250 lbs. per cubic yard. How many tons will 4.5 cubic yards weigh?

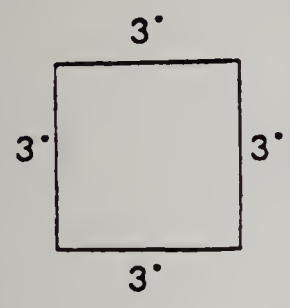
_____ tons

34. 12 tons of aggregate are needed and the aggregate weighs 2950 lbs. per cu. yd. How many cubic yards will be needed? (Round to tenths)

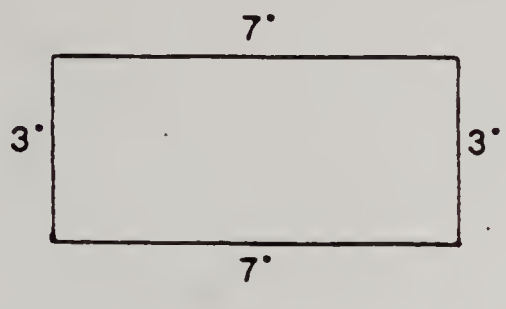
_____cu. yds.

Perimeter

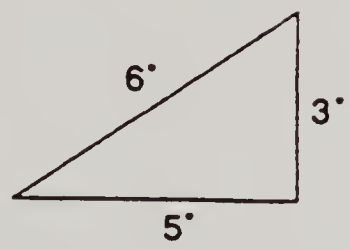
The perimeter of a plane closed figure is the distance around the outer boundary. This is found by adding together the lengths of all sides.



3 + 3 + 3 + 3 = 12"

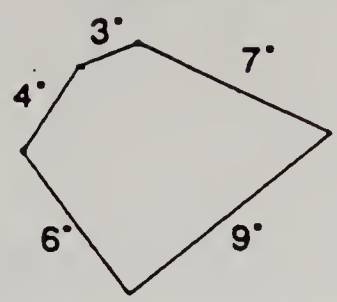


3 + 3 + 7 + 7 = 20"



6 + 3 + 5 = 14"

EXAMPLE: Find the perimeter of this polygon (many-sided figure).

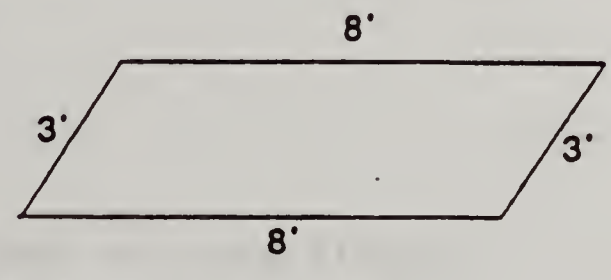


6 + 4 + 3 + 7 + 9 = 29"

The perimeter of the polygon is 29 inches.

In a rectangle or parallelogram opposite sides are parallel and equal in length. Therefore, the perimeter can be found by adding 2 times the length plus 2 times the width.

EXAMPLE:

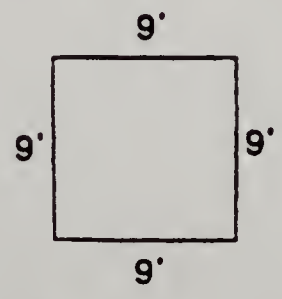


P = (2 x L) + (2 x W)
P = (2 x 8) + (2 x 3)
P = 16 + 6
P = 22

The perimeter of the parallelogram is 22 feet.

Because a square has four right angles and four sides of equal length, the perimeter can be found by multiplying the length of a side by 4.

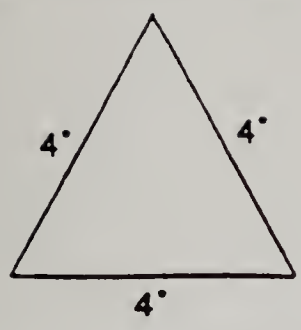
EXAMPLE:



P = s x 4
P = 9 x 4
P = 36

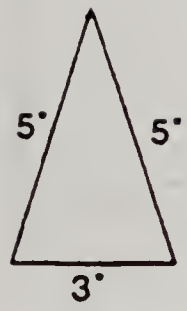
The perimeter of the square is 36 feet.

A figure having three angles and three sides is a triangle. The perimeter of a triangle is found by adding the lengths of the three sides. In an equilateral triangle, the sides are equal in length and the angles are each 60 degrees. An isosceles triangle has two sides and two angles of equal measurement. A right triangle has one angle measuring 90 degrees. In any triangle the three angles always add up to 180 degrees.



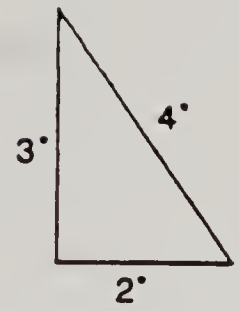
Equilateral

P = 4 + 4 + 4, or
P = 4 x 3
P = 12"



Isosceles

P = 3 + 5 + 5
P = 13"

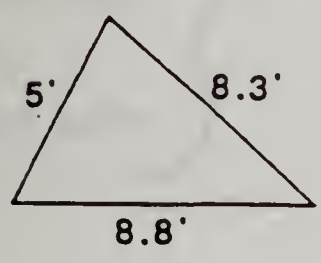


Right

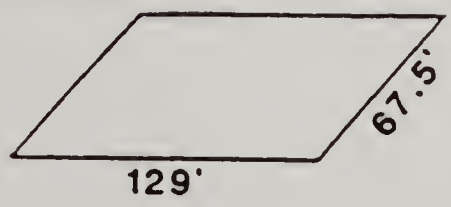
P = 3 + 4 + 2
P = 9"

35. Find the perimeter of each figure:

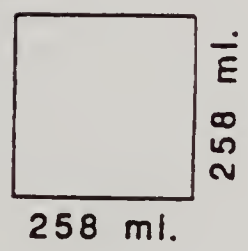
1.



2.



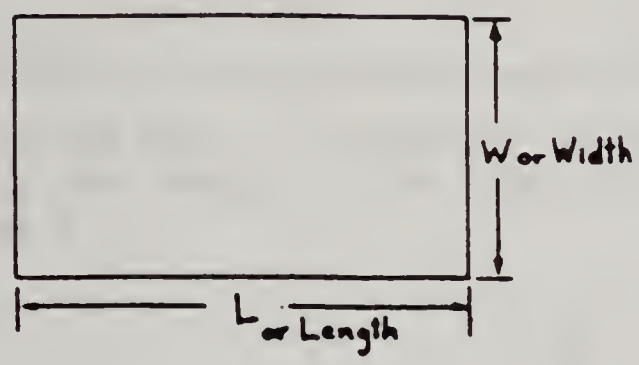
3.



Area Measurements

Area dimensions are measurements of surface sizes and are expressed as square inches, square feet, square yards and acres.

A = L x W, Area = Length x Width



In the above rectangle, length is a linear measurement -- width is another linear measurement.

Units of Area Measurement

Commonly used units of AREA measurement include:

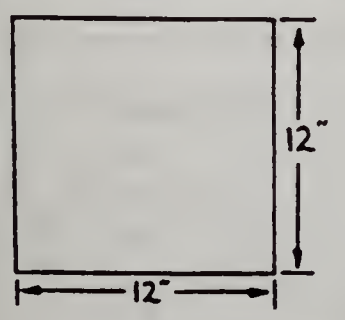
Square inches
Square feet
Square yards
Acres
Square miles

All of these are units of area measurement; each unit is expressed as a "Square" measurement.

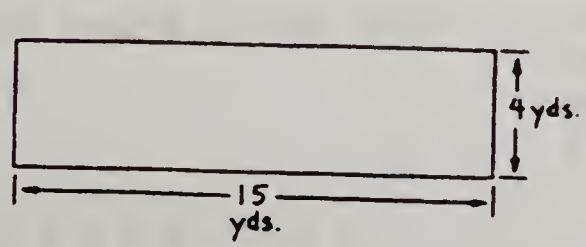
36. Calculate the area of the following figures:

Remember the formula: Area = Length x Width (A = L x W)

a)



b)



c)

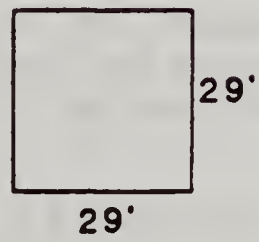
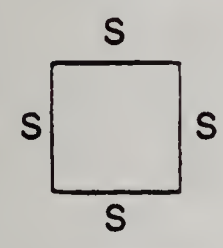
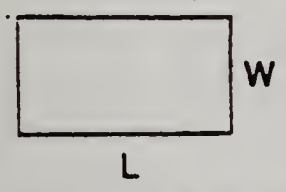
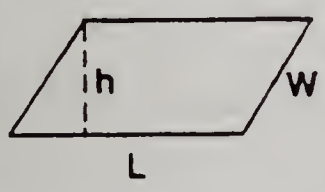
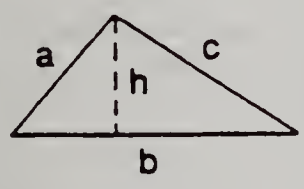
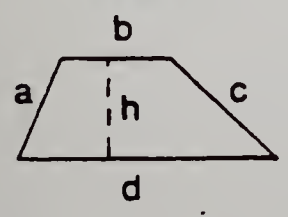
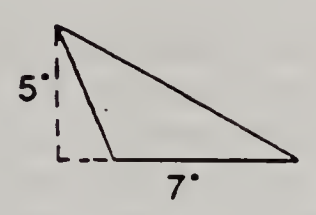


CHART OF FORMULAS FOR PERIMETER AND AREA

Figure	Perimeter	Area
Square 	Add the length of the four sides or multiply the length of one side times 4. $P = a + b + c + d$ OR $P = s \times 4$	Multiply the length of one side times itself. $A = s \times s$ OR $A = s^2$
Rectangle 	Add 2 times the length plus 2 times the width. $P = (2 \times L) + (2 \times W)$	Multiply length times width. $A = L \times W$
Parallelogram 	Add 2 times the length plus 2 times the width. $P = (2 \times L) + (2 \times W)$	Multiply base times height. $A = b \times h$
Triangle 	Add the length of the three sides. $P = a + b + c$	Take 1/2 of the product of base times height. $A = \frac{1}{2} (b \times h)$
Trapezoid 	Add the length of the four sides. $P = a + b + c + d$	Take 1/2 of the product of height times the sum of the lengths of the parallel sides. $A = \frac{1}{2} h \times (b + d)$
Circle	Circumference equals Pi times diameter. $C = \pi \times d$ OR $C = \pi \times 2r$	Multiply Pi times the radius squared. $A = \pi \times r^2$

To find the area of a triangle take one-half the product of base times height.



$A = \frac{1}{2}(b \times h)$

$A = \frac{1}{2}(7 \times 5)$

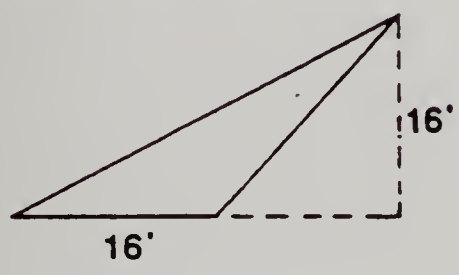
$A = \frac{1}{2} \times 35$

$A = \frac{35}{2}$

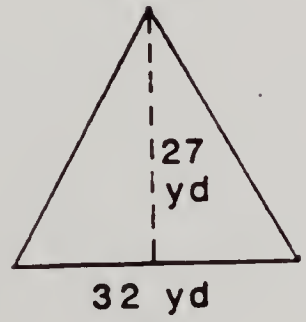
$A = 17\frac{1}{2}$ sq in or $17\frac{1}{2}$ in^2

37. Find the area of the triangles:

a)



b)



38. The Montana Department of Transportation (MDT) Maintenance Division owns a piece of property 270 feet by 300 feet wide. Two buildings are situated on this property. One building is a sand house and measures 32′ by 80′; the other is a fuel shed and measures 12′ by 12′. Find the ground area left after the buildings were erected.

39. A center line is placed on one city block 350 feet long. The centerline is two stripes, each 4" wide. How many gallons of paint are needed if one gallon covers 83 square feet? Round to the nearest tenth of a gallon.

1.

```
  (1)
   86
+ 78
-----
  164
```

2.

```
   111
   7999
+ 7785
-------
15,784
```

3.

```
   11
   306
   195
+ 440
-----
  941
```

4.

```
   122
   1194
   5469
   4706
+   335
---------
11,704
```

5.

```
     2 15
   7 ⅗ ⅘
- 6 0 9
-------
   1 2 6
```

6.

```
       6  13 13
   8   ⅞  ⅘  ⅗
-      5  9  9
-------------
   8  1  4  4
```

7.
```
      7  18 6  10
   8  ~~8~~ ~~8~~ ~~1~~ ~~0~~
 - 3  3  9  4  5
 ---------------
   5  4, 9  2  5
```

8.
```
  2
 49
 x3
 --
147
```

9.
```
    44
    44
    656
    x88
 ---------
    5248
 + 5248
 ---------
   57728
```

10.
```
  253
 3264
   x9
 ------
29,356
```

11.
```
   1724
5 | 8620
  -5
  ---
   36
  -35
  ---
    12
   -10
   ---
     20
    -20
    ---
      0
```

12.
```
     91
  ---------
9 | 819
  -81
  ---
    09
   - 9
   ---
     0
```

13.

$$
\begin{array}{r}
620 \\
5\overline{)3\,1\,0\,0} \\
-30 \\
\hline
10 \\
-10 \\
\hline
00 \\
0 \\
\hline
0
\end{array}
$$

14.

$$
\begin{array}{r}
147 \\
21\overline{)3087} \\
-21 \\
\hline
98 \\
-84 \\
\hline
147 \\
-147 \\
\hline
0
\end{array}
$$

15.

$$
\begin{array}{r}
29 \\
111\overline{)3219} \\
-222 \\
\hline
999 \\
-999 \\
\hline
0
\end{array}
$$

16.

$$
\begin{array}{r}
5\ R\,2 \\
60\overline{)302} \\
300 \\
\hline
2
\end{array}
$$

17. 1. 1/6 2. 4/7 3. 5/8
4. 1/9 5. 3/4 6. 6/12 or 1/2

18. a) 3 2/3 b) 2 4/5 c) 4 3/7

19. a) 89/100 b) 46 3/100 c) 5138 2/10
d) 265 732/1000 e) 1 8/10,000 f) 3 76/100
g) 5 904/1000 h) 83 25/1000 i. 9 2007/10,000

20. a) 429.7 b) 0.3125 c) 80.32

d) 125.6 e) 22.875 f) 5.296875

g) 77.4 h) 0.0051 i) 3.2083

21.

(a)

$$\begin{array}{r} 5.2391 \\ +19.0637 \\ \hline 24.3028 \end{array}$$

(b)

$$\begin{array}{r} 0.347 \\ +7.51 \\ \hline 7.857 \end{array}$$

(c)

$$\begin{array}{r} 2119.39 \\ +\ \ 4.25 \\ \hline 2123.64 \end{array}$$

22.

(a)

$$\begin{array}{r} 28.2 \\ -19.35 \\ \hline 8.85 \end{array}$$

(b)

$$\begin{array}{r} 950.0 \\ -\ 0.807 \\ \hline 949.193 \end{array}$$

(c)

$$\begin{array}{r} 62.3 \\ -6.0 \\ \hline 56.3 \end{array}$$

23.

$$\begin{array}{r} 22,536.8 \\ +\ 478.6 \\ \hline 23,015.4 \text{ miles} \end{array}$$

24. (a)

$$\begin{array}{r} 573 \\ \times 6.1 \\ \hline 573 \\ 3438 \\ \hline 3495.3 \end{array}$$

(b)

$$\begin{array}{r} 129 \\ \times 0.44 \\ \hline 516 \\ 516 \\ \hline 56.76 \end{array}$$

(c)

$$\begin{array}{r} 7.02 \\ \times 0.56 \\ \hline 4212 \\ 3510 \\ \hline 3.9312 \end{array}$$

25.

(a) 0.15

$$\begin{array}{r} .15 \\ 12\overline{)1.8} \\ 12 \\ \hline 60 \\ 60 \\ \hline 0 \end{array}$$

(b) 0.47

$$\begin{array}{r} .47 \\ 82\overline{)38.54} \\ 328 \\ \hline 574 \\ 574 \\ \hline \end{array}$$

(c) 15.625

$$\begin{array}{r} 15.625 \\ 4.8\overline{)75.00} \\ 48 \\ \hline 270 \\ 240 \\ \hline 300 \\ 288 \\ \hline 120 \\ 96 \\ \hline 240 \\ 240 \\ \hline 0 \end{array}$$

26. a) 42% b) 156% c) 1.8%
    d) 63% e) 95% f) 4%
    g) 83.3% h) 450% i) 37.5%

27. a) 0.91 b) 0.03 c) 0.007
    d) 1.45 e) 0.028 f) 0.695

28. 182.99

29. 39.77

30. 20.16

31. 119.7

32. a) 10 yds. b) 3 sq. yds.
    c) 1 mile d) 2 rods
    e) 54 sq. ft. f) 54 cu. ft.

33. 7.3 tons of mix.

34. 8.1 cu. yds. of aggregate (Rounded to nearest tenth)

35. 1) 22.1 ft. 2) 393 ft. 3) 1032 mi.

36. a) 144 square inches b) 60 sq. yds. c) 841 sq. ft.

37. a) 128 sq.ft. b) 432 sq.yds.

38. 32 x 80 = 2560 12 x 12 = 144 2560 + 144 = 2704

270 x 300 = 81,000 81,000 - 2704 = 78,296 sq.ft.

ANSWER - 78,296 sq.ft.

39. 8" = 2/3's of a foot. 2/3 = 0.6666666 or 0.67

0.67 x 350 = 234.5 sq. ft.

234.5 ÷ 83 = 2.825 or 2.8 (rounded to the nearest tenth)

ANSWER - 2.8 gallons of paint are needed.

EXAMPLE: Find percent notation for 3/8.

a) Divide the fraction to find decimal notation.

$$
\begin{array}{r}
.375 \\
8\overline{)3.000} \\
24 \\
\hline
60 \\
56 \\
\hline
40 \\
40 \\
\hline
0
\end{array}
$$

b. Move the decimal point two places to the right.

.375

$\frac{3}{8} = 37.5\%$

Finding a Percent of a Number

To find a percent of a number, change from percent to decimal notation, then multiply the number by the decimal fraction.

EXAMPLE: Find 12% of 50.

a) Change percent to decimal notation.

12% = 0.12

b) Multiply 50 by 0.12.

$$
\begin{array}{r}
50 \\
\times\ 0.12 \\
\hline
100 \\
50 \\
\hline
6.00
\end{array}
$$

Therefore, 12% of 50 is 6.

EXAMPLES: 11% of 49 = 0.11 x 49 = 5.39

70% of 14 = 0.70 x 14 = 9.8

40% of 65 = 0.40 x 65 = 26

Finding a Number When Percent of a Number is Known

To find an unknown number when percent of that number is given, divide the given number by the percent.

EXERCISE SET 1.2

Add.

1. $\begin{array}{r} 86 \\ +\ 78 \\ \hline \end{array}$

2. $\begin{array}{r} 280 \\ +\ 347 \\ \hline \end{array}$

3. $\begin{array}{r} 639 \\ +\ 586 \\ \hline \end{array}$

4. $\begin{array}{r} 8719 \\ +\ 1420 \\ \hline \end{array}$

5. $\begin{array}{r} 6775 \\ +\ 1432 \\ \hline \end{array}$

6. $\begin{array}{r} 7999 \\ +\ 7785 \\ \hline \end{array}$

7. $\begin{array}{r} 23,443 \\ +\ 10,989 \\ \hline \end{array}$

8. $\begin{array}{r} 67,654 \\ +\ 98,786 \\ \hline \end{array}$

9. $\begin{array}{r} 44,556 \\ +\ \ 4,863 \\ \hline \end{array}$

10. $\begin{array}{r} 26 \\ 82 \\ +\ 61 \\ \hline \end{array}$

11. $\begin{array}{r} 456 \\ 283 \\ +\ 623 \\ \hline \end{array}$

12. $\begin{array}{r} 306 \\ 195 \\ +\ 440 \\ \hline \end{array}$

13. $\begin{array}{r} 495 \\ 863 \\ 343 \\ +\ 412 \\ \hline \end{array}$

14. $\begin{array}{r} 3567 \\ 1023 \\ 5821 \\ +\ 3672 \\ \hline \end{array}$

15. $\begin{array}{r} 2003 \\ 149 \\ 58 \\ +\ 3426 \\ \hline \end{array}$

EXERCISE SET 1.2

1. 164
2. 627
3. 1225
4. 10,139
5. 8207
6. 15,784
7. 34,432
8. 166,440
9. 49,419
10. 169
11. 1362
12. 941
13. 2113
14. 14,083
15. 5636

EXERCISE SET 1.3

Subtract.

1. $\begin{array}{r} 86 \\ -\ 47 \\ \hline \end{array}$

2. $\begin{array}{r} 93 \\ -\ 28 \\ \hline \end{array}$

3. $\begin{array}{r} 86 \\ -\ 78 \\ \hline \end{array}$

4. $\begin{array}{r} 140 \\ -\ 54 \\ \hline \end{array}$

5. $\begin{array}{r} 625 \\ -\ 317 \\ \hline \end{array}$

6. $\begin{array}{r} 735 \\ -\ 609 \\ \hline \end{array}$

7. $\begin{array}{r} 853 \\ -\ 236 \\ \hline \end{array}$

8. $\begin{array}{r} 6769 \\ -\ 2377 \\ \hline \end{array}$

9. $\begin{array}{r} 3982 \\ -\ 2479 \\ \hline \end{array}$

10. $\begin{array}{r} 7654 \\ -\ 1765 \\ \hline \end{array}$

11. $\begin{array}{r} 8743 \\ -\ 599 \\ \hline \end{array}$

12. $\begin{array}{r} 12,647 \\ -\ 4,897 \\ \hline \end{array}$

13. $\begin{array}{r} 46,781 \\ -\ 12,988 \\ \hline \end{array}$

14. $\begin{array}{r} 75,654 \\ -\ 48,785 \\ \hline \end{array}$

15. $\begin{array}{r} 16,222 \\ -\ 5,779 \\ \hline \end{array}$

EXERCISE SET 1.3

1. 39
2. 65
3. 8
4. 86
5. 308
6. 126
7. 617
8. 4392
9. 1503
10. 5889
11. 8144
12. 7750
13. 33,793
14. 26,869
15. 10,443

EXERCISE SET 1.4

Multiply.

1. $\begin{array}{r} 49 \\ \times\ 3 \\ \hline \end{array}$

2. $\begin{array}{r} 899 \\ \times\ 5 \\ \hline \end{array}$

3. $\begin{array}{r} 723 \\ \times\ 40 \\ \hline \end{array}$

4. $\begin{array}{r} 656 \\ \times\ 88 \\ \hline \end{array}$

5. $\begin{array}{r} 289 \\ \times\ 430 \\ \hline \end{array}$

6. $\begin{array}{r} 718 \\ \times\ 642 \\ \hline \end{array}$

7. $\begin{array}{r} 847 \\ \times\ 700 \\ \hline \end{array}$

8. $\begin{array}{r} 3264 \\ \times\ 9 \\ \hline \end{array}$

9. $\begin{array}{r} 3482 \\ \times\ 104 \\ \hline \end{array}$

10. $\begin{array}{r} 8928 \\ \times\ 3172 \\ \hline \end{array}$

11. $\begin{array}{r} 6788 \\ \times\ 9000 \\ \hline \end{array}$

12. $\begin{array}{r} 9759 \\ \times\ 7892 \\ \hline \end{array}$

13. $\begin{array}{r} 5608 \\ \times\ 4500 \\ \hline \end{array}$

14. $\begin{array}{r} 43,777 \\ \times\ 8 \\ \hline \end{array}$

15. $\begin{array}{r} 71,036 \\ \times\ 923 \\ \hline \end{array}$

EXERCISE SET 1.4

1. 147
2. 4495
3. 28,920
4. 57,728
5. 124,270
6. 460,956
7. 592,900
8. 29,376
9. 362,128
10. 28,319,616
11. 61,092,000
12. 77,018,028
13. 25,236,000
14. 350,216
15. 65,566,228

EXERCISE SET 1.5

Divide.

1. $5\overline{)8\,6\,2\,0}$

2. $9\overline{)8\,1\,9}$

3. $21\overline{)3\,0\,8\,7}$

4. $54\overline{)2\,8\,0\,8}$

5. $8\overline{)5\,4\,4\,0}$

6. $82\overline{)4\,0\,1\,8}$

7. $111\overline{)3\,2\,1\,9}$

8. $69\overline{)9\,2\,4\,6}$

9. $117\overline{)4\,4,\,8\,1\,1}$

EXERCISE SET 1.5

1. 1724
2. 91
3. 147
4. 52
5. 680
6. 49
7. 29
8. 134
9. 383

EXERCISE SET 3.1

Write the following decimal numbers in fractional notation.

4. 0.89	5. 46.03	6. 5138.2
7. 265.732	8. 1.0008	9. 3.76
10. 5.904	11. 83.025	12. 9.2007

Write the following fractions in decimal notation.

13. 429 7/10	14. 5/16	15. 80 32/100
16. 125 3/5	17. 22 7/8	18. 5 19/64
19. 77 4/9	20. 51/10,000	21. 3 5/24

EXERCISE SET 3.1

4. 89/100
5. 46 3/100
6. 5138 2/10
7. 265 732/1000
8. 1 8/10,000
9. 3 76/100
10. 5 904/1000
11. 83 25/1000
12. 9 2007/10,000
13. 429.7
14. 0.3125
15. 80.32
16. 125.6
17. 22.875
18. 5.296875
19. $77.\overline{4}$
20. 0.0051
21. $3.208\overline{3}$

EXERCISE SET 3.2

Add.

1. $5.2391 + 19.0637$

2. $0.347 + 7.51$

3. $2119.39 + 4.25$

4. $35.83 + 81.005$

5. $774.0 + 14.961$

6. $3.94 + 52.46$

7. $94.002 + 3.729 + 2.3$

8. $65.59 + 137.2 + 20.401$

9. $17.0 + 3.24 + 0.256 + 21.36889$

Subtract.

10. $28.2 - 19.35$

11. $950.0 - 0.807$

12. $62.3 - 6.0$

13. $18.0074 - 5.15$

14. $70.009 - 0.98$

15. $39.07 - 1.409$

16. $7.28 - 1.7$

17. $6.634 - 2.592$

18. $45.24881 - 25.09908$

EXERCISE SET 3.2

1. 24.3028
2. 7.857
3. 2123.64
4. 116.835
5. 788.961
6. 56.4
7. 100.031
8. 223.191
9. 41.8649
10. 8.85
11. 949.193
12. 56.3
13. 12.8574
14. 69.029
15. 37.661
16. 5.58
17. 4.042
18. 20.1573

EXERCISE SET 3.4

Multiply.

1. 2.17×10

2. 573×6.1

3. 129×0.44

4. 34×0.0023

5. 7.02×0.56

6. 0.0038×0.65

7. 89.05×11.24

8. 1000×0.839

9. 3.005×0.623

10. 98.43×100

11. 82.178×4.75

12. 3.09×0.0075

EXERCISE SET 3.4

1. 21.7
2. 3495.3
3. 56.76
4. 0.0782
5. 3.9312
6. 0.00247
7. 1000.922
8. 839
9. 1.872115
10. 9843
11. 390.3455
12. 0.023175

EXERCISE SET 3.5

Divide.

1. $6 \div 15$
2. $1.8 \div 12$
3. $121 \div 200$
4. $38.54 \div 82$
5. $3 \div 40$
6. $75 \div 4.8$
7. $2184 \div 4.2$
8. $15 \div 195$
9. $1.581 \div 0.017$
10. $0.828 \div 3.6$
11. $7.641 \div 0.54$
12. $0.1462 \div 34$

EXERCISE SET 3.5

1. 0.4
2. 0.15
3. 0.605
4. 0.47
5. 0.075
6. 15.625
7. 520
8. 0.076923
9. 93
10. 0.23
11. 14.15
12. 0.0043

EXERCISE SET 4.1

Convert to percent.

1. 0.42
2. 1.56
3. 0.018
4. $\frac{63}{100}$
5. $\frac{19}{20}$
6. $\frac{3}{75}$
7. $\frac{5}{6}$
8. $\frac{18}{4}$
9. $\frac{21}{56}$

Convert to decimal notation.

10. 91%
11. 3%
12. 0.7%
13. 145%
14. 2.8%
15. 69.5%

Solve.

16. Find 29% of 631.
17. Find 41% of 97.
18. Find 9% of 224.
19. Find 66.5% of 180.
20. Find 203% of 76.
21. Find 78% of 8.
22. 8% of what number is 45?
23. 75% of what number is 69?
24. 16% of what number is 212?
25. 39.5% of what number is 158?

EXERCISE SET 4.1

1. 42%
2. 156%
3. 1.8%
4. 63%
5. 95%
6. 4%
7. $83.\overline{3}\%$
8. 450%
9. 37.5%
10. 0.91
11. 0.03
12. 0.007
13. 1.45
14. 0.028
15. 0.695
16. 182.99
17. 39.77
18. 20.16
19. 119.7
20. 154.28
21. 6.24
22. 562.5
23. 92
24. 1325
25. 400

EXERCISE SET 5.1

Find the equivalent measurement.

1. 8 in = _____ ft

2. 15 mi = _____ ft

3. 4.6 yd = _____ ft

4. 23 yd = _____ in

5. 8 mi = _____ yd

6. 11,616 ft = _____ mi

7. 9480 lb = _____ T

8. 46 lb = _____ oz

9. 332 oz = _____ lb

10. 2T = _____ oz

11. 920 acres = _____ sq mi

12. 3/4 acre = _____ sq ft

13. 8.5 sq mi = _____ acres

14. 1 sq yd = _____ sq in

15. 8,716,356 sq ft = _____ acres

16. 5103 cu ft = _____ cu yd

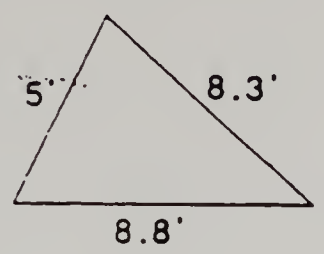
EXERCISE SET 5.1

1. 2/3 ft
2. 79,200 ft
3. 13.8 ft
4. 828 in
5. 14,080 yd
6. 2.2 mi
7. 4.74 T
8. 736 oz
9. 20.75 lb
10. 64,000 oz
11. 1.4375 sq mi
12. 32,670 sq ft
13. 5440 acres
14. 1296 sq in
15. 200.1 acres
16. 189 cu yd

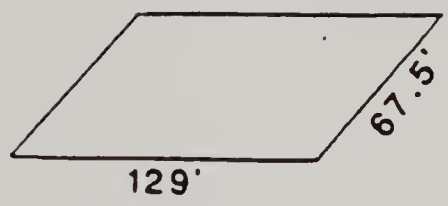
EXERCISE SET 5.2

Find the perimeter of each figure.

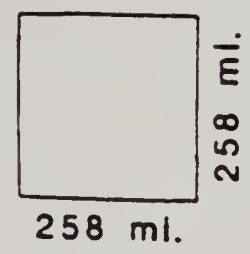
1.



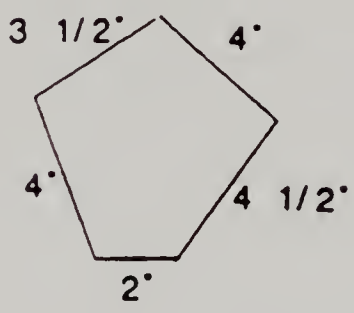
2.



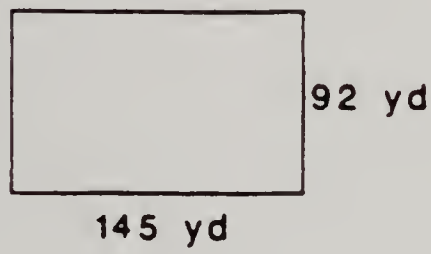
3.



4.



5.



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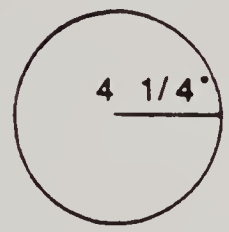
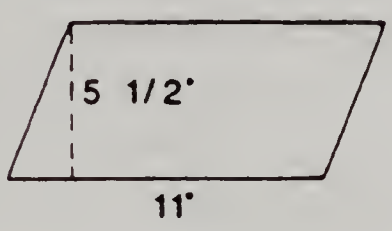
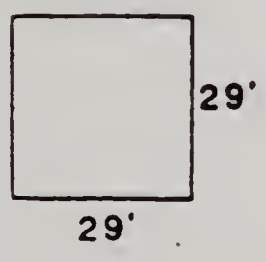


Find the area of each figure.

7.



8.



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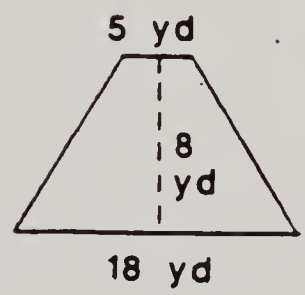

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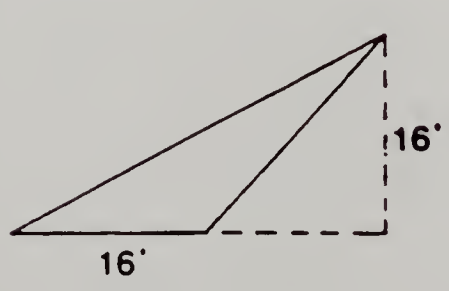

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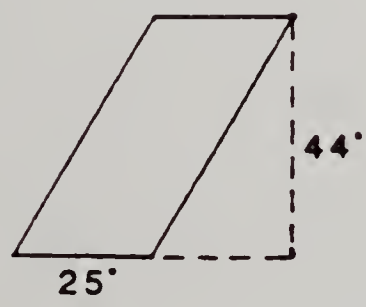

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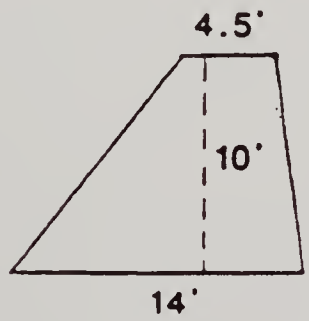

EXERCISE SET 5.2

1. 22.1 ft
2. 393 ft
3. 1032 mi
4. 18 in
5. 474 yd
6. 26.7036 in
7. 60.5 sq in
8. 841 sq ft
9. 92 sq yd
10. 128 sq ft
11. 1100 sq in
12. 92.5 sq ft

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